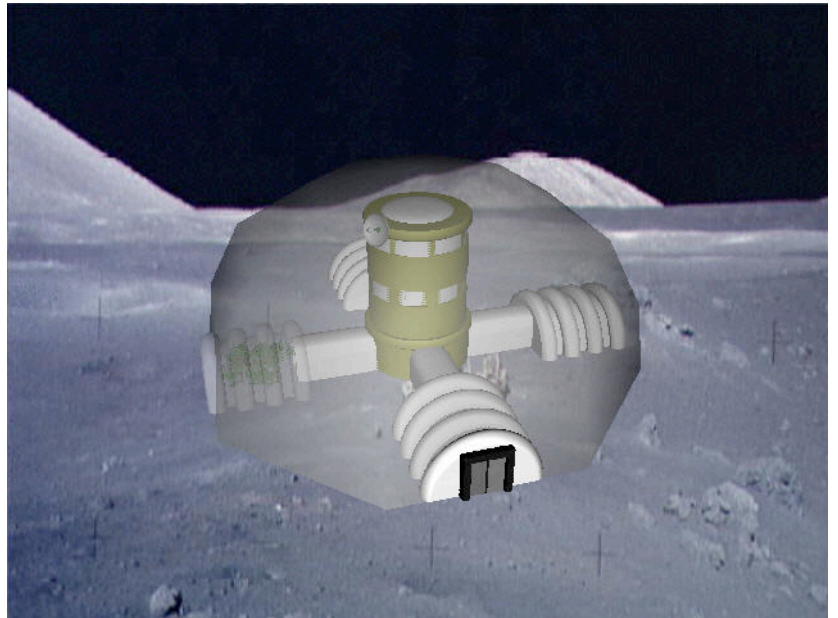


Celia

Space Station Prototype

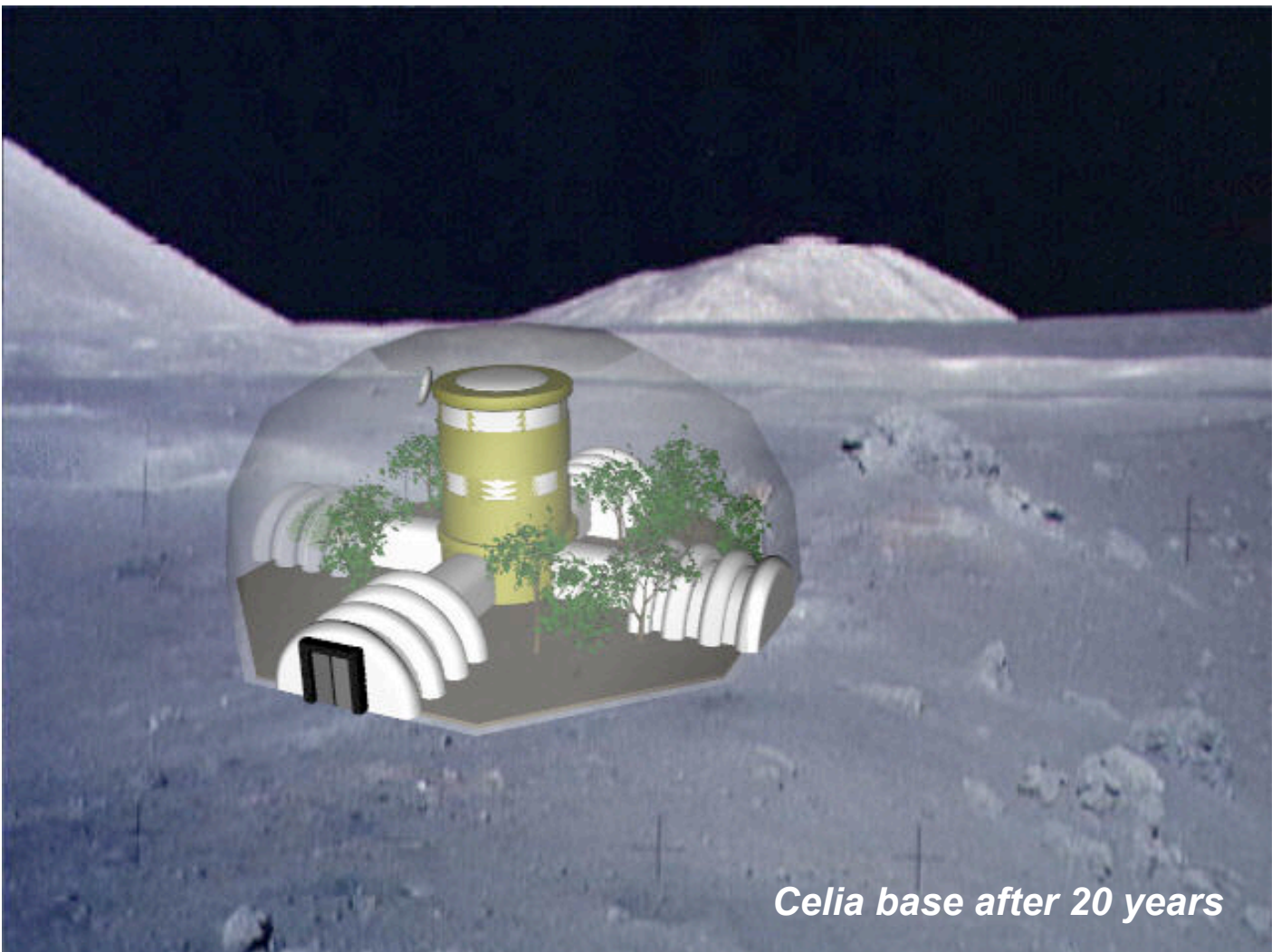
*by Alice Faux-Nightingale
and Nicholas Duncombe
S. Peter's Collegiate School
Wolverhampton*

Celstial Experimental Lab Is Advanced



Introduction

Celia is an experimental laboratory, space station to be built on the moon. Astronauts would spend up to 6 months on the base carrying out experiments and lunar exploration. As well as lots of small experiments and tests, the whole base is a long term experiment in making a living environment on the moon. This would be doing the best with water from the base but might also be able to use small amounts of water from the polar regions of the moon.



Celia base after 20 years

Layout

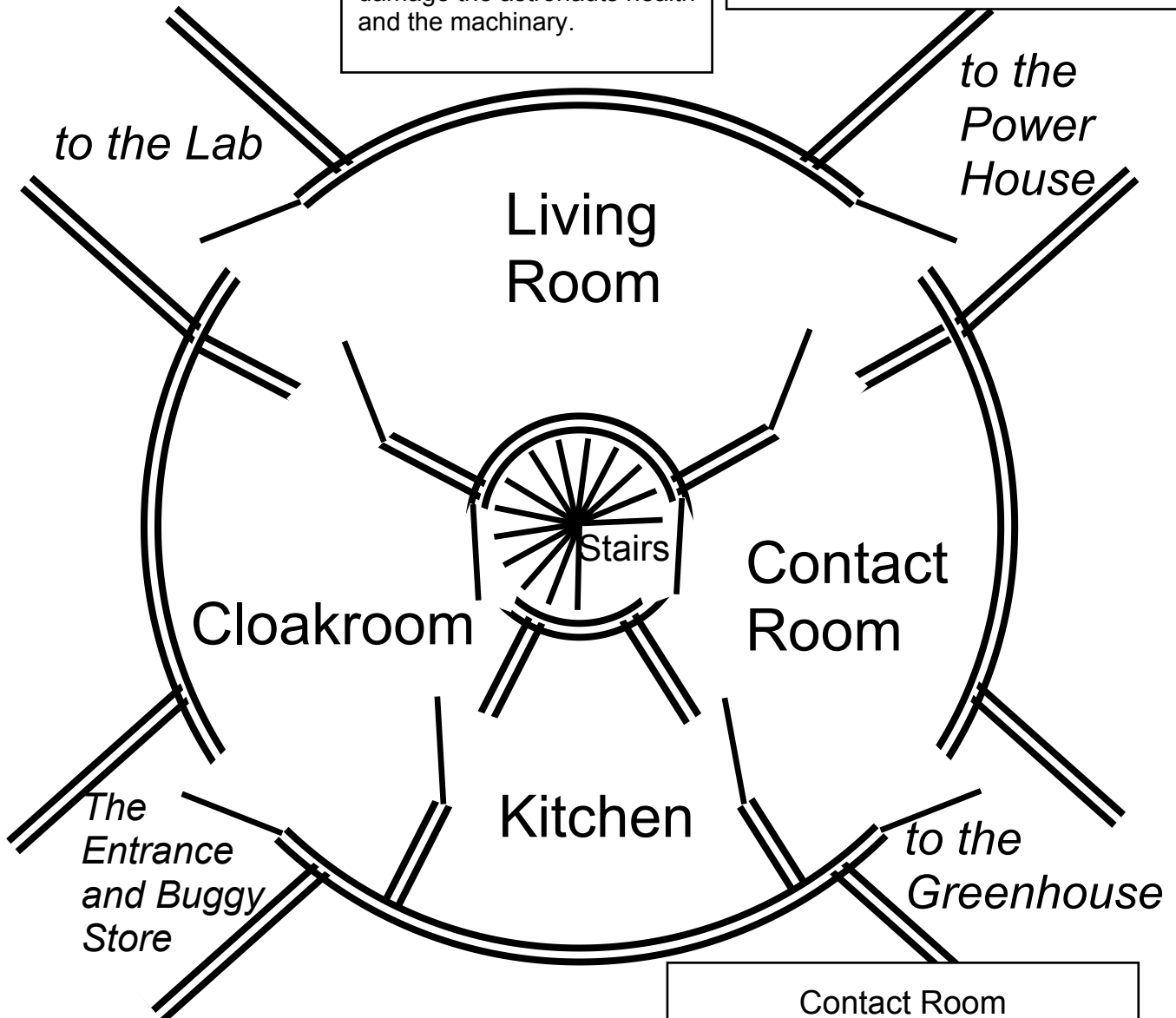
Ground Floor

The Cloakroom

Our cloakroom is a small room where astronauts can put their spacesuits while they are in the spacestation. There will be a small roma like Hoover that will run on rechargeable batteries, and clean the room methodically of space dust that could damage the astronauts health and the machinery.

The Kitchen

The kitchen has all of the necessary items i.e. a cooker and fridge etc. but all of them are programmed to run on as little energy as possible. Also there is a table that will seat 4, and a laminate, easy to clean floor. The kitchen will be white, which is a basic, neutral colour that should make the astronauts feel no unnecessary feelings.



Living Room

This has easy chairs, a space to relax and chat, during their free time. It also contains books, games and a video screen for DVDs (TV signals would not be very strong on the moon) This room will be painted sky blue to cool down the astronauts mentally and help them to relax.

Contact Room

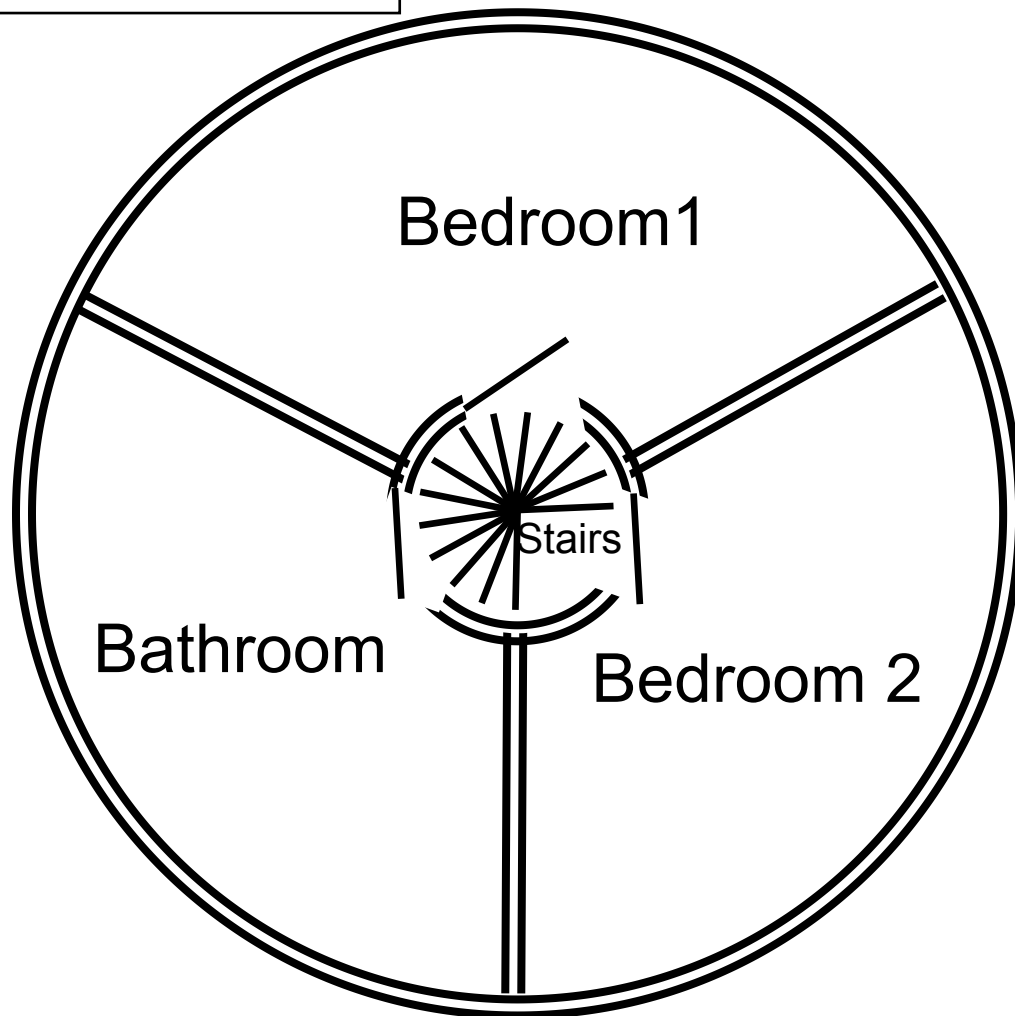
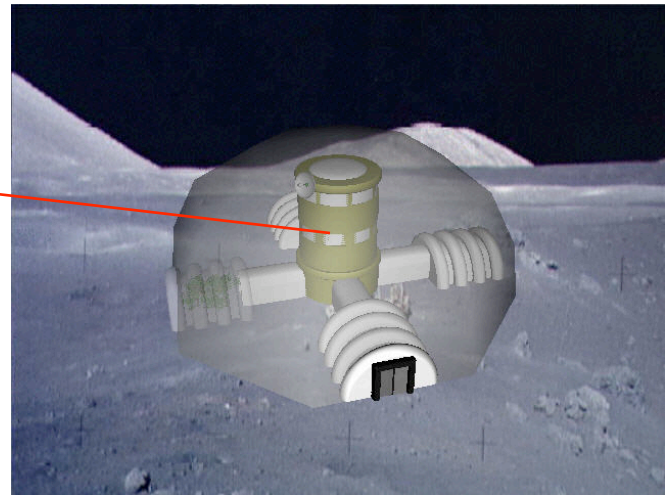
This contains equipment to communicate with incoming spacecraft and a virtual reality conferencing room. Here people can send time in virtual reality with friends and family back on earth. We shall also have a telescope included with a camera attached, because there are no clouds on the moon thanks to the lack of atmosphere, which means that we will get better images.

Layout

First Floor

Bedroom 1

This is going to be painted green because green makes the body feel relaxed, and slightly wild, therefore making the astronauts ready to go out for the day.



Bathroom

There will be an on suite toilet facility with each bedroom but to limit the amount of waste water the bath and shower facility will be in one room. The room will be painted blue to cool the astronauts when they are relaxing.

Bedroom 2

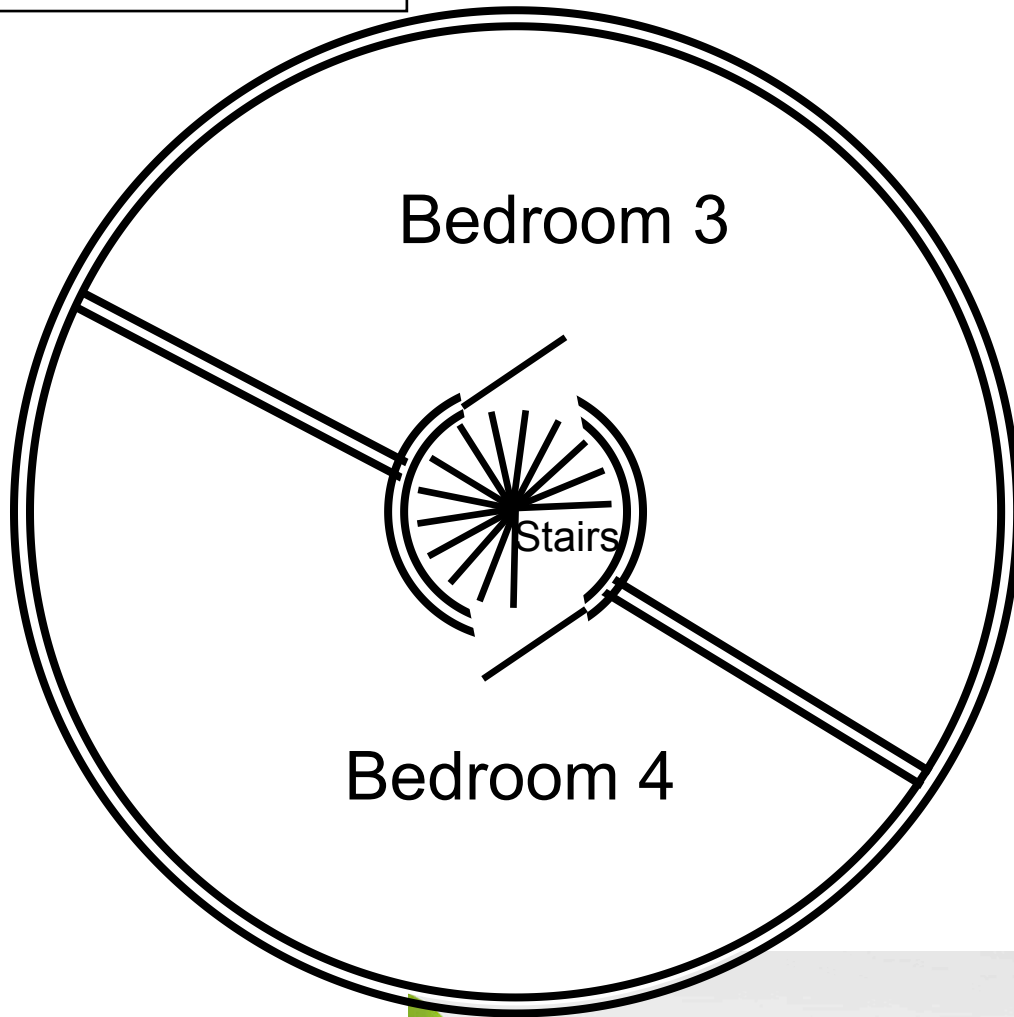
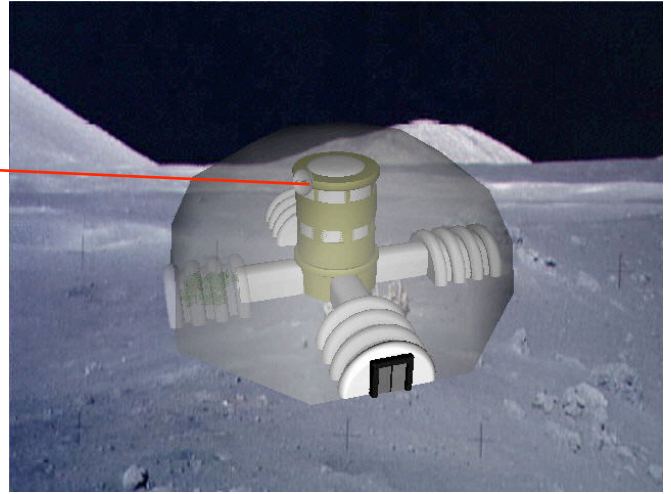
This room is going to be painted orange which is said to make a person feel warm, and if a person feels warm, they go to sleep quicker, making them feel ready to go to work the next day.

Layout

Second Floor

Bedroom 3

This is going to be painted baby blue because unlike blue, it makes the person feel warmer, which means that the astronaut will go to sleep quicker and have more energy for work the next day.



Bedroom 4

This room is going to be painted yellow because yellow is said to make a person feel warm, and if a person feels warm, they go to sleep quicker, making them feel ready to go to work the next day.



Food System

Greenhouse

Our greenhouse is going to provide all of the food that the astronauts will eat while living in the station. Protein will be grown using mycoprotein processes to grow mushroom protein which can be made into meat substitute. We will also grow mainly English fruits which are hardy and can survive in most conditions. We will use artificial light and energy efficient light bulbs to let the plants grow. To grow these we will either use the method of hydroponics, or Crystal soil (jelly that absorbs water and then releases it with plant food, slowly when necessary.) Also note that the trees that we will be growing are fruit trees, so they don't grow very tall, therefore the ceiling does not need to be very high. The kind of plants that we will grow are:

Herbs: Mint Chives Fennel Sage Lavender

Trees: Soya (for milk) Apple Plum Walnut

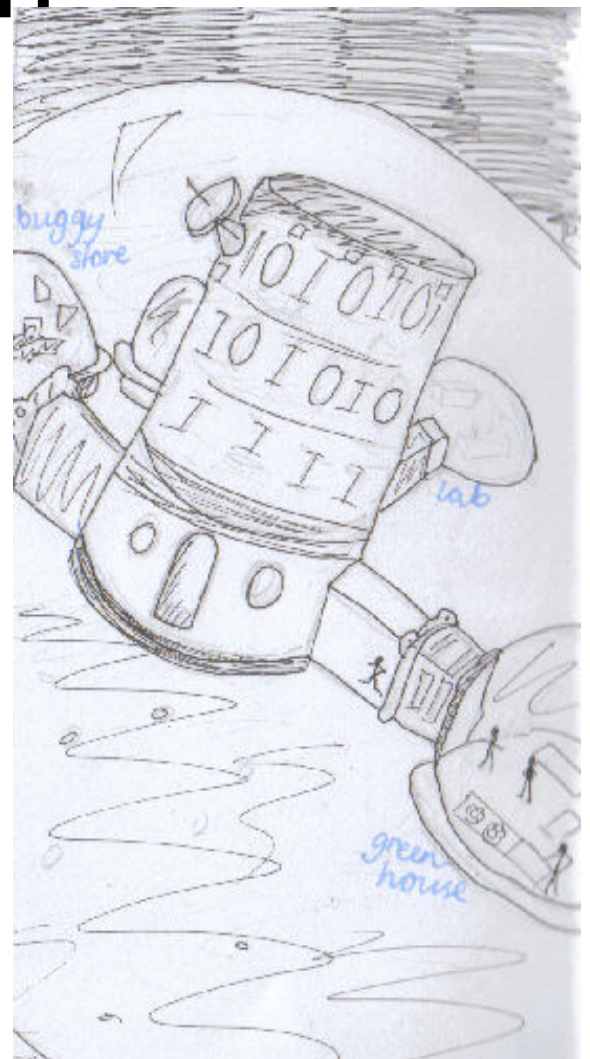
Plants: Wheat Rice Carrots Spinach Cabbage Onions
Sunflowers (for oil) Raspberries Strawberries Beans



Energy System

The Power Plant

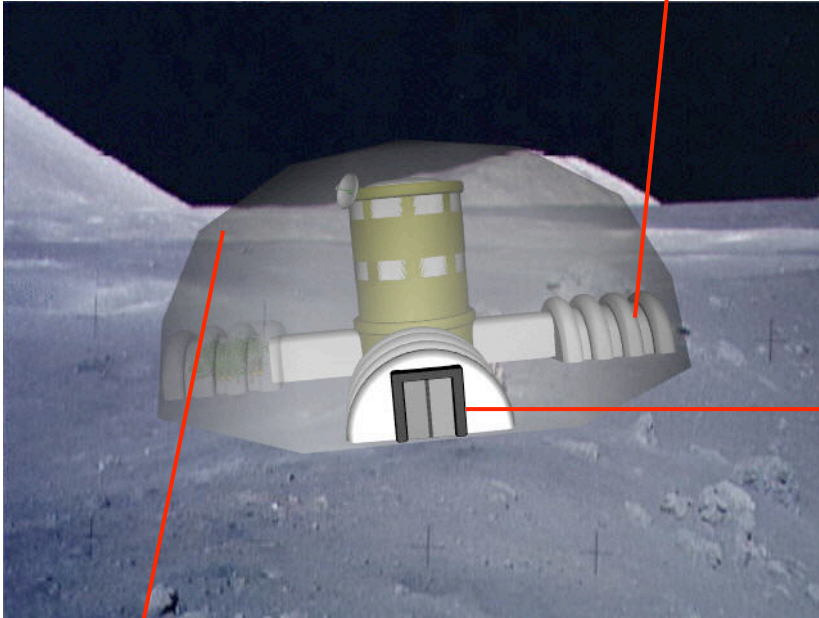
The power for the whole complex is supplied by a hydrogen powered generator. Hydrogen and oxygen are supplied in pressurised tanks from Earth. The oxygen is used to maintain the atmosphere in the space station and to burn the hydrogen. Hydrogen is very explosive and is used as a fuel to generate electricity. The only byproduct of this reaction is water which is needed both for people and for the crops that are being grown. There would also be a bank of solar panels supplying power during the solar days. This could supply a base level of power and any excess used to release and collect hydrogen and oxygen, through electrolysis. This system would give the astronauts a low level self sufficiency which might be needed if there was a problem getting more supplies from earth.



Other Small Units

The Lab

The Lab is made so that the astronauts can make an analysis of anything that they find on the moon straight away. This would allow a wide range of experiments to be carried out without having to refer back to earth all the time. The lab has air tight doors to allow the astronauts to go out on to the moons surface. It also has an isolation corridor so that it can be sealed off from the rest of the station if there is an emergency.



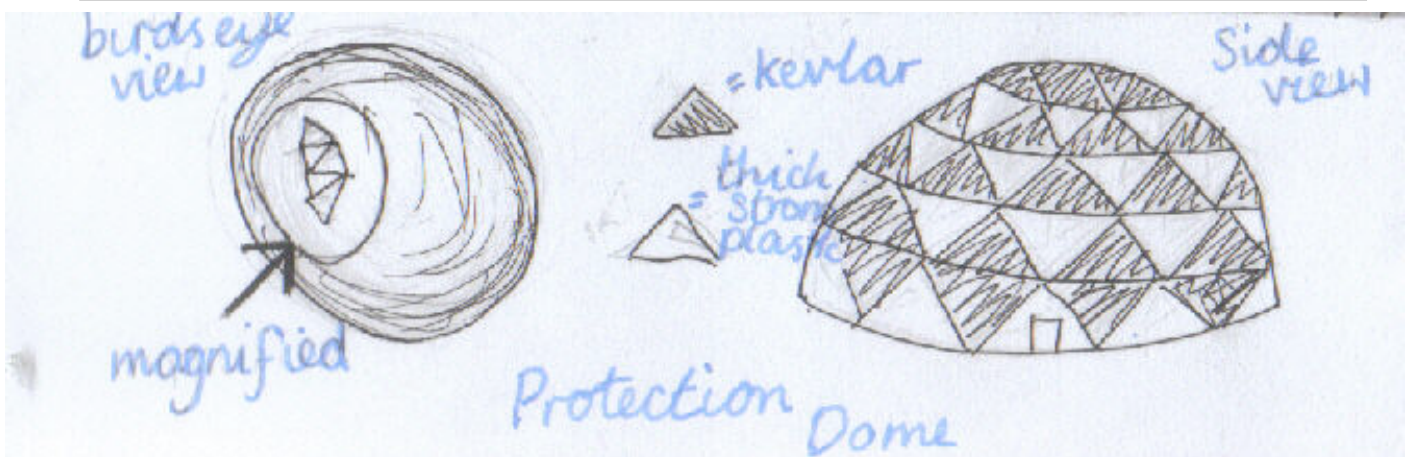
Entrance and The buggy store

The buggy store is the room in which all the vehicals and larger equipment needed out on the moons surface is stored. The whole store is an air lock so that it can have large doors to allow vehicals in and out when needed.

Protective Dome

Geodesic Dome

This dome, is there to protect the space station from radiation and to allow for an atmosphere to be made so that later plants can be grown under it. It is made out of triangles, for strength and there are alternate material used. The top eight triangles, are going to be kevlar, which is very strong, and does not let UV rays enter the station, and also ensures that if the dome gets hit from above, then it won't break. Further down, there are triangles made from thick acrylic, which will stop UV rays coming through and our astronauts getting radiation poisoning, the clear plastic also allows light to pass through.



Astronaut Homely Help

Astronaut's Personal Items

The astronaut will have two boxes 250X350X500 mm to fill with their own clothes, books, toys, gadgets etc. from home. This is to make the spacestation more homely, and make the astronauts enjoy themselves more while there.

Pictures

To make the bedrooms more homely, we will compile a catalogue, with which the astronauts can pick four and take them up to the station, and when the astronauts return after five or more months, they will pack all of the comfort items that NASA supply and bring them back, so that others can use them when they go



Vinyl Wall Murals

The astronauts will be given a choice of wall designs to take up and decorate their walls. The base wall will be a basic neutral colour. At the end of their stay they just remove the designs that they have had so that other people will be able to redecorate that room.

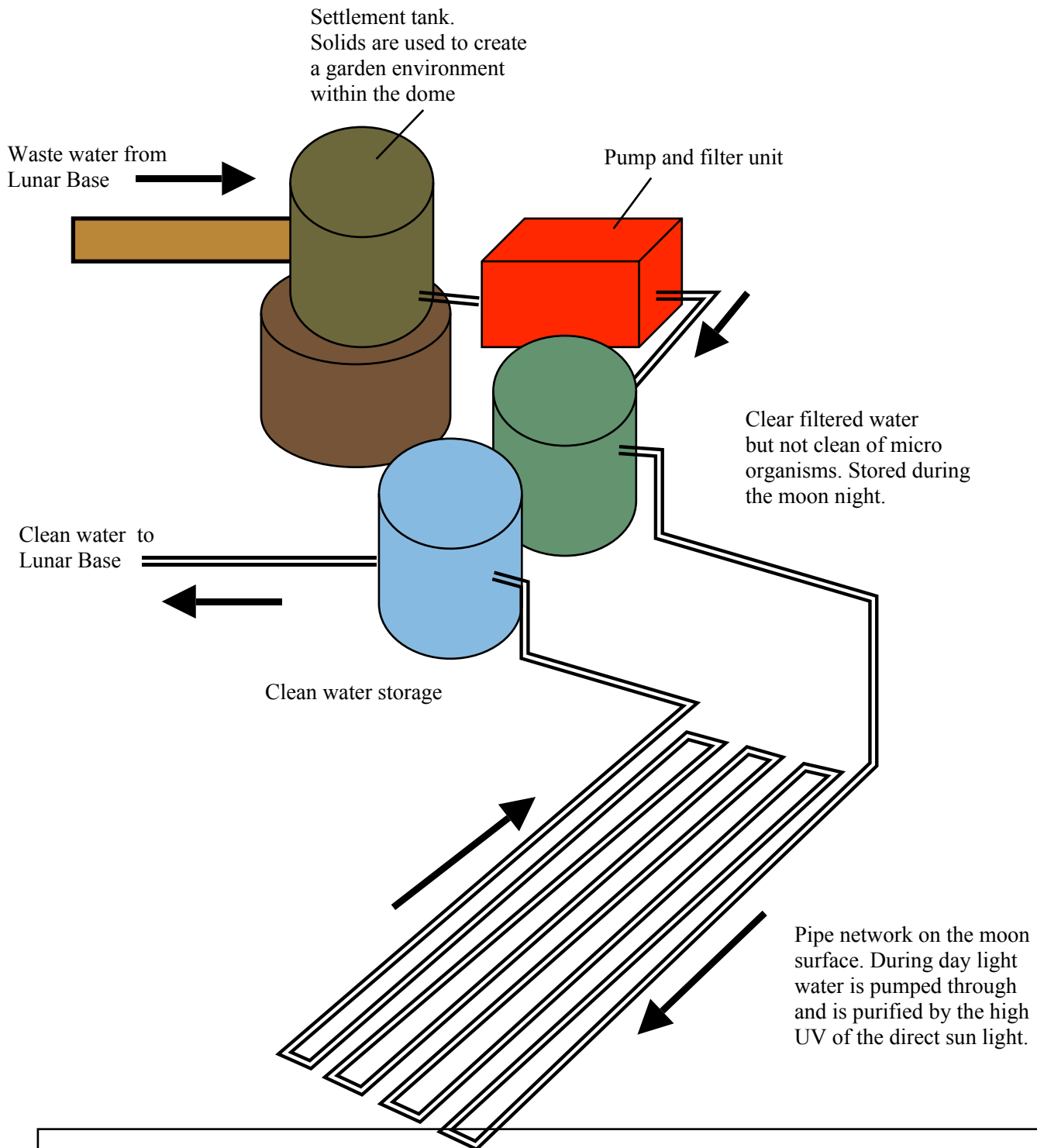
Furniture

Again like the pictures, there will be a selection of different items of furniture in a catalogue, the astronauts will be able to pick 2 items to take up to the moon, and bring back to earth at the end of their voyage.

Reward System

When the astronauts perform one of the training tasks or likewise activities well, they will be given what looks like a ration card, which will allow them to take up one extra kind of food or plant .i.e. sweets/chocolate, crisps, pop, or an extra fruit plant. Which should make the astronauts work harder as well. Also, when the astronauts are on a space walk, and/or if they do something particularly good, then they will be given another ration card which will either allow them to have something special in the spacestation .i.e. have a bath, or have a phone call to family. They could have one day with more relaxations in it, i.e. seep in, longer time on playstation etc.

Astronaut Technical Help



The water system

So that we don't waste any water, there will be a filtration and purification system in process. The water will be sent through a settlement tank and filter system, which will take away large amounts of waste. The water will be then sent through a series of pipes laid out on the unprotected surface of the moon. The very high UV radiation of the the direct sunlight will kill any micro organism and we are left with clean water. The solid waste from the tank will be sterilised and sent through tubes into the areas under the dome, outside the base. Over time this area will develop into a growing space with an atmosphere and soil for plants. This would be a long term experiment in maintaining life in space and might make living on the base easier and more like home on Earth.